

Energy Analysis Contest Activity Details

Teams are required to submit a total of four energy analysis deliverables. However, only the first three deliverables will be evaluated by the Energy Analysis Jury. The Jury will generate a single score for the Energy Analysis Contest Activity based on its evaluation of the Schematic Energy Analysis Report, the Comprehensive Energy Analysis Report, and the Simulation Input Form. The Jury will be looking for effective communication and synthesis of the team's design and analysis process, focusing on the application of sound modeling and engineering principles and creative analysis.

The following is a brief description of each of the required deliverables.

1. **Schematic Energy Analysis Report (due June 13, 2006):** This report is intended to summarize the preliminary, or “schematic,” energy analysis supporting the development of the team's house design. Discussion should highlight key features of the house design that were affected by energy analysis and simulation results. A typical discussion of key features of the design would include annual energy source estimates (e.g., PV and solar thermal); annual energy load estimates, including lighting, heating, cooling, and domestic hot water heating; and other loads (e.g., electric car charging). Additional overall results worthy of discussion could include Event site climate statistics, predicted monthly energy balance (energy collected versus energy used), space temperatures, or other indicators chosen to highlight the energy performance of the design.
2. **Comprehensive Energy Analysis Report (due August 7, 2007):** This report shall consist of two sections:

Section I – Influence of Energy Analysis on House Design and Competition Strategy: The objective of the Schematic Energy Analysis Report was to summarize the schematic energy analysis supporting the development of the team's original house design. During the period of time since the submission of the Schematic Energy Analysis Report in June 2006, it is likely that teams have continued to use energy analysis tools and techniques to iteratively “fine-tune” the house design, to develop detailed system designs, and perhaps even to develop competition strategies. Section I of the Comprehensive Energy Analysis Report should describe how energy analysis was used to inform design and strategy decisions since the submission of the Schematic Energy Analysis Report.

Section II – Projected Performance of Final House Design on an Annual Basis: Simulation tools are not only used to inform design decisions. They are also used to project the long-term performance of the design. Long-term energy simulations are often used to extol the virtues of new technology and advanced design before actual energy performance data has been collected. Of course, one must avoid the temptation to present overly optimistic projections based on unrealistic assumptions, lest the design gain a reputation for being “overrated” after long-term energy performance data has been collected. Section II of the Comprehensive Energy Analysis Report should include long-term projections (simulations over a 1-year time period are typical) of the house's energy performance. Teams are encouraged to project energy performance on both a whole-house basis and system-

by-system basis by simulating the performance of all the house's energy-producing and energy-consuming systems. Results should be reported for a range of geographic locations and occupancy behavior patterns.

3. **Simulation Input Form (due August 7, 2007):** To enable side-by-side comparisons among all the houses, teams are required to complete a form that asks for all the detailed house and system information required to run a comprehensive whole-building energy simulation. In addition to using the form to generate inputs for building energy simulations of the houses before and after the Competition, the Organizers will also use the form to generate a summary of all major systems and equipment that will be published in the 2007 Solar Decathlon Technical Report and other publications. The Simulation Input Form will be developed by the Organizers and posted on the Yahoo! Group.
4. **Updated Simulation Input Form (due January 9, 2008):** Because it is due after the Competition, the Updated Simulation Input Form will obviously not count toward a team's score. However, this is a very important contract deliverable and shall reflect the final installed configuration of the house and its systems on the permanent house site.

Format Requirements

- There are no restrictions on the simulation tools that can be used for this analysis, but all such tools should be clearly identified.
- One electronic copy (Microsoft Word document or Adobe PDF for reports and Microsoft Excel for simulation input forms) of each deliverable must be uploaded to the appropriate team folder on the Solar Decathlon FTP site (ftp://ftp.nrel.gov/pub/solar_decathlon/Team_Folders/) or e-mailed directly to Mike Wassmer at michael_wassmer@nrel.gov on the respective due date by 5 p.m. Mountain time. Points will be deducted for lateness.
- The main body of the Schematic Energy Analysis Report may not exceed 15 single-sided pages, using a single-spaced 11-pt font. The pages must be 8.5 in. X 11 in. (or closest metric equivalent) and may include any embedded building plans and graphics that are appropriately placed in the body of the report. Appendix material (e.g., data sheets, simulation results, and screen captures) may be included, if desired. The appendices should have the same format as the body of the report and may not exceed 15 pages.
- The main body of the Comprehensive Energy Analysis Report may not exceed 25 single-sided pages, using a single-spaced 11-pt font. The pages must be 8.5 in. X 11 in. (or closest metric equivalent) and may include any embedded building plans and graphics that are appropriately placed in the body of the report. Appendix material (e.g., data sheets, simulation results, and screen captures) may be included, if desired. The appendix should have the same format as the body of the report and may not exceed 25 pages.